with an alcohol in the presence of a solid base catalyst comprising at least one component selected from the group consisting of sodium carbonate, calcium oxide, calcium hydroxide, calcium carbonate and magnesium oxide under conditions in which at least one of the oil or fat and the alcohol is in a supercritical state at a temperature exceeding 260 °C. As demonstrated in the examples, the claimed invention enables particularly desirable results to be achieved in connection with the production of the fatty acid ester. Applicants' invention is also directed to a fuel or base oil comprised of the fatty acid ester produced by applicants' process. Applicants' invention is neither disclosed nor suggested by the prior art.

Rejection under 35 USC 102(b) over GB 795573

Claim 1 stands rejected under 35 USC 102(b) as being anticipated by GB 795573. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

In support of the rejection, the Examiner takes the position that the reference teaches a process of producing fatty acid esters from natural oils by reacting the oils with an

alcohol in the presence of a basic catalyst under supercritical conditions. In order to assist the Examiner in consideration of the cited reference, applicants submit a full copy of the cited reference (an Abstracted copy only being made available by the Examiner).

In contrast to the claimed invention, the reference teaches the use of zinc silicate as the catalyst, while teaching that the reaction occurs at 250 °C. See page 2, lines 68-76 of the patent in this regard. The reference is totally silent with respect to the use of a catalyst as now recited in amended claim 1 (i.e., sodium carbonate, calcium oxide, calcium hydroxide, calcium carbonate and magnesium oxide).

Further, applicants have well demonstrated the advantages that exist with respect to conducting the reaction at a temperature in excess of 260 °C. The Examiner's attention is directed to Comparative Example 1 of applicants' specification in this regard. In Example 1, soybean oil and methanol are reacted at 300 °C in the presence of a sodium carbonate catalyst to produce methyl ester and glycerol in yields of 99% respectively.

By contrast, when a reaction temperature of 250 °C is employed as taught by the reference, conversions of only 87% and

68%, respectively, are obtained (even when twice as much sodium carbonate catalyst is employed).

In view of the above, not only does the cited reference not anticipate the invention of claim 1, but the reference fails to render obvious the invention, and the rejection should accordingly be withdrawn.

Rejection under 35 USC 103(a) over ES 2124166

Claims 1 and 2 stand rejected under 35 USC 103(a) as being obvious in view of ES 2124166. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The cited reference fails to disclose or suggest the invention of amended claim 1 wherein at least one of the oil or fat and the alcohol is in the supercritical state during the reaction, as well as the use of a reaction temperature in excess of 260 °C. Indeed, the reference teaches the use of temperatures in the range of 25-260 °C, while being silent with respect to the use of supercritical conditions.

Again, the Examiner's attention is directed to Comparative Example 1 of applicants' specification which demonstrates that the use of a temperature of 250 °C (consistent with the teachings

of the cited reference) does not enable the advantages of the present invention to be obtained The teachings of the cited reference accordingly do not lead one of ordinary skill in the art to the claimed invention.

The rejection is thus without basis and should be withdrawn.

Rejection under 35 USC 103(a) over Ullmann

Claims 1-2 stand rejected under 35 USC 103(a) as being unpatentable over Ullmann ("Transesterfication of Triglycerides"). This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The Examiner states that Ullmann teaches the transesterifcation of triglycerides by use of an alkaline catalyst and an alcohol. In contrast to the claimed invention, Ullmann teaches the use of reaction temperatures between 220 and 250 °C (page 281, column 2). Applicants' Comparative Example 1 demonstrates that reaction temperatures on the order of 250 °C do not enable the results desired by applicants to be achieved. Further, as Ullmann is silent with respect to the use of supercritical conditions in the reaction, the reference cannot be said to suggest the use of such conditions in the reaction.

In view of the above, the rejection is without basis and should be withdrawn.

Rejection under 35 USC 103(a) over Stern et al and Cahen

Claims 3-15 stand rejected under 35 USC 103(a) as being unpatentable over Stern et al U.S. Patent No. 5,908,946 and Cahen U.S. Patent No. 4,161,483. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The Examiner takes the position that Stern teaches transesterification of vegetable or animal oil with an alcohol in the presence of a zinc catalyst. The stated reaction conditions include a temperature in the range of 170-250 °C and a pressure less than 100 bar (column 4, lines 60-64). Stern is silent with respect to the use of a nickel catalyst as required by applicants' claim 3. Instead, the patent teaches the use of zinc oxide, aluminum oxide and zinc aluminates (see claim 1 of the patent). Stern is also silent with respect to the use of a reaction temperature in excess of 260 °C and supercritical conditions. As discussed above, applicants have demonstrated that highly desirable results can be obtained by use of reaction

conditions in excess of 260 °C as opposed to the use of reaction temperatures as taught by the reference.

The additionally-cited Cahen reference does not cure the deficiencies of Stern. Cahen is cited to teach the use of nickel as a catalytic component in the process of Stern. However, nickel is used as a hydrogenation component in Cahen as opposed to transesterification. The respective teachings of the references accordingly cannot be combined in the manner suggested by the Examiner.

The rejection is thus without basis and should be withdrawn.

Rejection under 35 USC 103(a) over Stern et al and GB 795573

Claims 3-15 stand rejected under 35 USC 103(a) as being unpatentable over Stern et al U.S. Patent No. 5,908,946 and GB 795573. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The Examiner takes the position that Stern teaches transesterification of vegetable or animal oil with an alcohol in the presence of a zinc catalyst. The stated reaction conditions include a temperature in the range of 170-250 °C and a pressure less than 100 bar. As discussed above, Stern is

silent with respect to the use of a nickel catalyst as required by applicants' claim 3. Stern is also silent with respect to the use of a reaction temperature in excess of 260 °C and supercritical conditions. As also discussed above, applicants have demonstrated that highly desirable results can be obtained by use of reaction conditions in excess of 260 °C as opposed to the use of reaction temperatures as taught by the reference.

The additionally-cited GB patent does not cure the deficiencies of Stern. While the GB patent teaches the use of nickel silicate as a catalyst, such teachings are directed to a hydrogenation reaction as opposed to transesterification. The respective teachings of the references accordingly cannot be combined in the manner suggested by the Examiner.

The rejection is thus without basis and should be withdrawn.

The application is now believed to be in condition for allowance and an early indication of same is earnestly solicited.

In the event that any outstanding matters remain in this application, Applicants request that the Examiner contact James W. Hellwege (Reg. No. 28,808) at (703) 205-8000 to discuss such matters.

Applicant respectfully petitions under the provisions of 37 CFR 1.136(a) and 1.17 for a two-month extension of time in which to respond to the Examiner's Office Action. The Extension of Time Fee in the amount of $400.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

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CLAIM AMENDMENTS WITH MARKINGS TO SHOW CHANGES

Claim 2 has been cancelled

The claims have been amended as follows:

1. (Amended) A process for producing a fatty acid ester from an oil or fat and an alcohol, wherein the process comprises reacting an oil or fat with an alcohol in the presence of a solid base catalyst comprising at least one component selected from the group consisting of sodium carbonate, calcium oxide, calcium hydroxide, calcium carbonate and magnesium oxide under conditions in which at least one of the oil or fat and the alcohol is in a supercritical state at a temperature exceeding 260 °C.